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THE DESCRIPTION AND Manner of Uſing Mr. *Wilſon*'s Sett of *Pocket-Microſcopes*,

Lately Publiſh'd in the
Philoſophical Tranſactions, N° 281,
And mention'd in
N° 284, 285, &c.

WHICH
MICROSCOPES
ARE WITH
Great Eaſe apply'd in viewing Opake, Tranſparent and Liquid Objects: As the *Farina* of the Flowers of Plants, *&c.* The *Circulation of the Blood* in divers living Creatures, *&c.* The *Animalcula in Semine*, &c.

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LONDON:
Printed in the Year, MDCCVI.

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MVSEVM BRITANNICVM

THE PREFACE

THE *Uſe of* Microſcopes *is ſo well known, that it's as needleſs to Attempt their Recommendation to the Inquiſitive, as it would be tedious to numerate their particular Advantages in Natural Inquiries: No one who looks into the Secret Structure of the Regular Productions of* Nature, *but muſt readily confeſs our Eyes ſtand in great need of* Them: *Nor is it a little Entertaining to find the Excellent Mechaniſm and Beauty of Natural Objects appear more finiſhed, by how much* They *are the more magnified with good* Microſcopes: *On the other Hand, what Confuſion muſt it be to an* Atheiſt *(if there can be much ſuch an one) to ſee the moſt celebrated Pieces of Art appear Courſe, Deform'd, and altogether more Unfiniſh'd, by how much* They *are Magnified.*

The late Improvements made by Magnifying-Glaſſes *are not ſo much owing to the Making* Them, *and Compoſing* Microſcopes, *as the Methods of applying Objects for the Advantage of* Light; *in which, I hope the* Inſtruments *before us will not be found inferiour to any yet Made, at leaſt commonly Sold. Experience, as well as the Authority of the Excellent Dr.* HOOK, *in his* Preface *to his* Micrographia, *aſſure us, That Single* Magnifying-Glaſſes (*when they can be uſed*) *are preferable to* Microſcopes, *compoſed of Two or more* Magnifying-Glaſſes. *It is far from my Deſign to diſcommend any Sort of* Microſcopes *now in Uſe, or to recommend thoſe I make, any further than they are foun Uſeful by thoſe Inquiſitive Gentlemen who are pleaſed t have* Them *of me.*

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Deſcription
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Mr. *Wilſon's* Sett of *Pocket-Microſcopes*, &c.

THIS *Sett* of *Microſcopes* has *Nine* different *Magnifying Glaſſes*; *Eight* of *which* may be *Uſed*, with Two different *Inſtruments*, for the better applying *Them* to various Objects: One of theſe *Inſtruments* is repreſented Fig. I. A A A A, and is made of Ivory, it hath 3 thin Braſs Plates, E, E, and a Spring of Steel H within it; to one of the thin Plates of Braſs is fixed a piece of Leather F, with a ſmall Furrow G..... both in the Leather and Braſs to which it is affixed: In one End of this *Inſtrument* there is along Screw, D, with a *Convex-Glaſs* C, placed in the End of it: In the other end, there is a hollow Screw, o o; wherein any of the *Magnifying Glaſſes* M, are ſcrewed when they are to be made Uſe of. The 9 different *Magnifying-Glaſſes* are all ſet in Ivory, 8 of which are ſet in the Manner expreſs'd at M. The greateſt Magnifier is marked upon the Ivory wherein it is ſet with N° 1, the next N° 2, and ſo on till N° 8: The 9th Glaſs is not marked, but ſet in the Manner of a little Barrel Box of Ivory, as in Fig. II.

e e A flat *piece of Ivory*, whereof there are 8 belonging to this Sett of *Microſcopes*, (tho' any one who has a mind to keep a Regiſter of Objects may have as many of them as he pleaſes) in each of *which* there are 3 Holes f f f, wherein 3 or more Objects are placed between Two thin *Glaſſes*, or Talks, when to be uſed with the greater Magnifyers.

The other *Inſtrument* Fig. III. is made of Braſs or Prince's Mettal, with Joints P P P, to turn eaſily any way with a ſmall pair of Tongs G G, which open at the points K, by preſſing together the Two Heads of the Pins I I for taking up of Objects: At the other End of theſe Tongs G G, is ſcrewed on a round piece of black Wood H, with a piece of Ivory let into it, for placeing Opacke Objects on, according to their difference of Colour.

Upon the End L there is a Screw, into which the *Glaſs* Set in the Barrel-box may be ſcrewed; when the others are to be uſed, there is a Ring R of Braſs to be ſcrewed on the End L, into which Ring all the orher *Glaſſes* M, may be ſcrewed; So when any Object is taken up in the Points of the Tongs K, or laid upon the other End H, it may be very eaſily (as one who ſees the *Inſtrument* will perceive) be applyed to the true Diſtance of any of the *Glaſſes* M, by the help of the Joints P P P, and by means of the Screw C, with the Wheel D, Fig. III. which will bring the Object to the exactneſs of the *Center* or true Diſtance, being regulated by a Spring N.

The uſe of the firſt mention'd *Inſtrument*, Fig. I. A A A A is thus: Take one of your flat pieces of Ivory e e, or *ſliders*, (if you pleaſe to call them ſo) and ſlide it in betwixt the Two thin Plates of Braſs E E, in the Body of the *Microſcope*, ſo that the Object you intend to look upon be juſt in the middle, remarking that you put that ſide of the Plate e e, where the Ring is, fartheſt from your Eye: Then you are to Screw into o o, (the hollow Screw in the End of the Body of your *Microſcope*) the 3*d*, 4*th*, 5*th*, 6*th* or 7*th Magnifying-Glaſs* M; which being done, while you are looking through your *Magnifying Glaſs* upon the Object, you are to Screw in or out, the long Screw D, Fig. I. in the other End of the Body of your *Microſcope*, till you bring your Object into the true Diſtance, which you will know by ſeeing the Object Clearly and Diſtinctly: But ſeeing that in the greater Magnifiers you can ſee but a ſmall part of the Object, *viz.* the Legs or Claws of a Flea; while you are looking upon any Part of the Object, if ye take hold of the End of the Plate or Slider, e e whereon the Object lyes, and move it gently, you may ſee the whole Object ſucceſſively, or any part of the Object you pleaſe; and if that part of the Object you deſign to look upon be out of the true Diſtance, remember your End Screw D, Fig. I. can always bring it in, by ſcrewing it nearer or farther off.

After this Manner may be ſeen all Tranſparent Objects, Duſts, Liquids, Chryſtals of Salts, ſmall Inſects, ſuch as Fleas, Mites, *&c.* If they be *Inſects* that will creep away, or ſuch Objects as one intends to keep, they may be placed between the two *Regiſter Glaſſes* f f. For by taking out (with the Point of a Pen-knife or ſmall Plyers) the Ring that keeps in the *Glaſſes* f f where the Object lies *they* will fall out of themſelves; ſo you may lay the Object, between the two hollow ſides of *them*, and put the Ring in as it was before: But if the Objects be Duſts or Liquids, a ſmall drop of the Liquid, or a little of the Duſt laid on the outſide of the *Glaſs* f f, and applyed as before, will be ſeen very eaſily.

As to the Firſt Second and Third Magnifying *Glaſſes*, being marked with a ✠ upon the Ivory wherein they are ſet, they are only to be uſed with thoſe *Plates* or *Sliders* that are alſo marked with a ✠, wherein the Objects are plac'd between two thin Talks, becauſe the thickneſs of the *Glaſſes* in the other *Plates* or *Sliders*, hinder the Object from approaching to the *Center* or true diſtance of theſe greater Magnifiers. But the manner of uſing them is the ſame with the former. Only remember to be careful when you put in or pull out the *Plate* or *Slider* e e, whereon the Object lyes, or move it from one Object to another, not to let it rub your Magnifying-*Glaſs*, which is done by unſcrewing a little the End Screw D, Fig. I. when ye put in or pull out your *Plate*, or move it from one Object to another.

For ſeeing the *CIRCULATION of the BLOOD* at the Extremities of the *Arteries* and *Veins*, in the Tranſparent Parts of *Fiſhes Eels*, &c. There are two *Glaſs Tubes*, the one bigger, and the other leſſer, is expreſs'd at g g, wherein the *Fiſh* is to be put; when theſe *Tubes* are to be uſed, you are to unſcrew the End Screw D, Fig. I. in the Body of the *Microſcope*, untill the *Tube* g g, can be receiv'd eaſily into that little Cavity G of the Braſs Plate, faſtened to the Leather F, under the other two thin Plates of Braſs E E: When the *Tail* of your *Fiſh* lies flat to the *Glaſs Tube*, ſet it oppoſite to your Magnifying-*Glaſs*, and by ſcrewing in or out your End Screw D, Fig. I. as is ſaid before, you may eaſily bring it to the true diſtance, and ſee the Blood *Circulate* with great Pleaſure.

If you would ſee the *Blood Circulate* in a *Frog*'s *Foot*, chooſe ſuch a *Frog* as will juſt go into your *Tube*, then with a little Stick, *&c.* expand the *Hinder Foot* of the *Frog*, and apply it cloſe to the ſide of the Tube, obſerving that no part of the *Frog* hinders the Light coming on its *Foot*, and when you have it at the juſt diſtance, by means of the Screw D, Fig. I. as aboveſaid, you will ſee the rapid *Motion* of the *Blood*, in its *Veſſels*, which are very Numerous, in the Tranſparent thin Membrane that's between the *Frog*'s *Toes*; For this Object the 4th and 5th Magnifyers will do very well; but you may ſee the Circulation in the Tails of *Water-Newts*, with the 6th and 7th *Glaſs*, by reaſon the Globules of the Blood of thoſe *Newts* are as big again as the Globules of the Blood of *Frogs* or ſmall *Fiſh*, as has been taken notice of in N. 280. of the *Philoſophical Tranſactions*, Pag. 1184.

N. B. The *Circulation* cannot be ſo well ſeen by the Firſt Second and Third Magnifyers, becauſe the thickneſs of the

Glaſs wherein the Fiſh lyes hinders the Approximation of the Object from the true Focus of the *Glaſs.*

S, Fig. I. is a little Ivory Screw, upon which the Handle of the *Braſs Inſtrument* W, Fig. III. may be ſcrewed, and ſerve for a Handle to This Ivory one alſo.

The *Glaſs*, plac'd in the manner of a Barrel Box, Fig. II, is only to be uſed with the Braſs Inſtrument (or in your Hand) being the leaſt Magnifyer, for greater Objects, ſuch as Flys and common Inſects, *&c.* A hole being made in the ſide of this Box Fig. II. whereby it may be ſcrewed on the Point L, Fig. III. of the Braſs Inſtrument, remembring to put the end b next to your Eye, and the other to the Object; ſo if you take up an Inſect in the Point of the Tongs K, or lay any Opake Object on H the other end, you may approach them to the true diſtance by means of the Joynts and Screw ſpoken of before C, D, P, N, Fig. *ib.*

In the viewing of *Objects*, one ought to be careful not to hinder the Light from falling upon *Them*, by the Hat, Perruke, or any other thing, eſpecially when they are to look upon Opake Objects: for nothing can be ſeen with the beſt of *Glaſſes*, unleſs the Object be in a due diſtance, with a ſufficient Light.

The beſt Lights for the Plates or Sliders, where the Object lyes between the two *Glaſſes*, is a clear Sky-light, or where the Sun ſhines on any white thing, or the reflection of the Light from a Looking-glaſs. The light of a Candle is likewiſe good for the viewing of very ſmall Objects, though it be a little uneaſie to thoſe who are not practis'd in *Microſcopes* to find out the Light of the Candle.

By what is here ſaid, it's hop'd that the uſe of this *Microſcope*, eaſie of its ſelf, will be much eaſier to thoſe that uſe it; yet it cannnot be doubted of *This*, as of all other Inſtruments of this nature, but that *Uſus plura docebit.*

For the conveniency of thoſe who would *Draw*, or make any *Sketches* or *Deſigns* after *Microſcopical* Objects, they may alſo have a Pedeſtal to fix the two *Inſtruments* above deſcribed, and make them ſtationary to any convenient Light. This Pedeſtal may be plac'd on a Table, *&c.* and after the Object and Light are fixed, as many perſons as pleaſe may view the Object, without any trouble or difficulty in finding the Light.

The reſt of the annexed *Figures* were drawn by this *Microſcope* from ſeveral *Objects*.

A the *Artery*, B the *Vein*, C their communicant Canal, by which the Blood is ſeen paſſing from the *former* to the *latter*, in the Tail of the *Fiſh*, expreſs'd at g g.

D the *Animalcula* in *Semine maſculino*, by the firſt *Glaſs*.

E one of the *Farina* of the Flower of *Malows* which magnified is the Area repreſented at D.

F the Branch of an Artery, G that of a Vein. The intermediate Spaces ſhew the manner they communicate unto one another, in the Sides of the Lungs of *Frogs*, *Newts*, &c.

H one of the Feathers of a *Moth's* Wing.

FINIS.